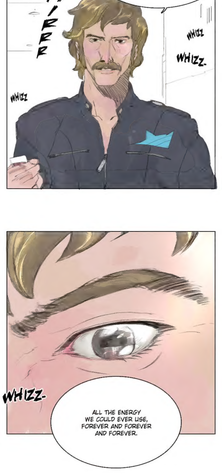
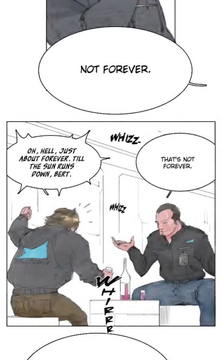
The last question was asked for the first time, half in jest, on May 21, 2061, at a time when humanity first stepped into the light.

The question came about as a result of a five-dollar bet over highballs, and it happened this way.

AD 2061.05.21



ALL THE ENERGY WE CAN POSSIBLY EVER USE FOR FREE. ENOUGH ENERGY, IF WE WANTED TO SPEAK ON IT, TO MELT ALL EARTH INTO A BIG DROP OF IMPURE LIQUID IRON, AND STILL NEVER MISS THE ENERGY SO USED.
WHIRRR
WHIZZ
WHIZZ

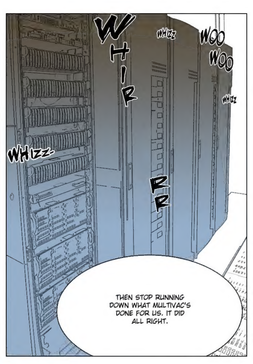


WHIZZ
WHIZZ
SCRATCH
TEN BILLION YEARS ISN'T FOREVER.

WELL, IT WILL LAST OUR TIME, WON'T IT?

SO WOULD THE COAL AND URANIUM.

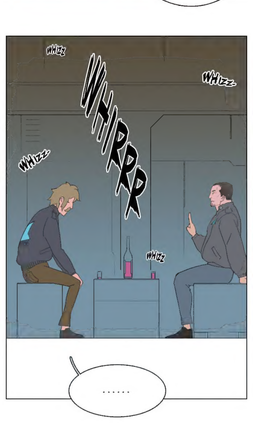
ALL RIGHT, BUT NOW WE CAN HOOK UP EACH INDIVIDUAL SPACE-SHIP TO THE SOLAR STATION, AND IT CAN GO TO PLUTO AND BACK A MILLION TIMES WITHOUT EVER WORRYING ABOUT FUEL. YOU CAN'T DO THAT ON COAL AND URANIUM.
WHIZZ
ASK MULTIVAC, IF YOU DON'T BELIEVE ME.
HEHE
I DON'T HAVE TO ASK MULTIVAC. I KNOW THAT.


WHIRRR
WHIZZ
WOO WOO
WHIZZ
WHIZZ
THEN STOP RUNNING DOWN WHAT MULTIVAC'S DONE FOR US. IT DID ALL RIGHT.

WHO SAYS IT DIDN'T? WHAT I SAY IS THAT A SUN WON'T LAST FOREVER.
WHIZZ
WHIZ

THAT'S ALL I'M SAYING. WE'RE SAFE FOR TEN BILLION YEARS. BUT THEN WHAT?

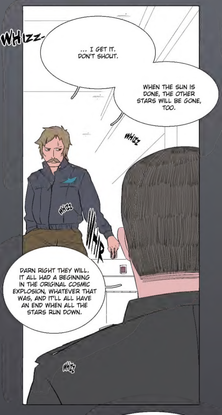
FLAT
OUT
WHIZZ
WHIZZ
AND DON'T SAY WE'LL SWITCH TO ANOTHER SUN.


WHIZZ
WHIRRRR
WHIZZ
WHIZZ
WHIZZ
. . . . . .

WHIRRRR
WHIZZ
WHIZZ
YOU'RE THINKING WE'LL SWITCH TO ANOTHER SUN WHEN OURS IS DONE, AREN'T YOU?
WHIRRRR
WHIZZ

... I'M NOT THINKING.
WHIZZ
WHIRRRR

SURE YOU ARE. YOU'RE WEAK ON LOGIC. THAT'S THE TROUBLE WITH YOU.
YOU'RE LIKE THE GUY IN THE STORY WHO WAS CAUGHT IN A SUDDEN SHOWER AND WHO RAN TO A GROVE OF TREES AND GOT UNDER ONE.
WHIZZ
WHIZZ
HE WASN'T WORRIED, YOU SEE, BECAUSE HE FIGURED WHEN ONE TREE GOT WET THROUGH, HE WOULD JUST GET UNDER ANOTHER ONE.


WHIZZ
... I GET IT. DON'T SHOUT.
WHEN THE SUN IS DONE, THE OTHER STARS WILL BE GONE, TOO.
WHIZZ
DARN RIGHT. THEY WILL. IT ALL HAD A BEGINNING IN THE ORIGINAL COSMIC EXPLOSION, WHATEVER THAT WAS, AND IT'LL ALL HAVE AN END WHEN ALL THE STARS RUN DOWN.
WHIR
WHIZZ

SOME RUN DOWN FASTER THAN OTHERS.
HELL, THE GIANTS WON'T LAST A HUNDRED MILLION YEARS. THE SUN WILL LAST TEN BILLION YEARS AND MAYBE THE DWARFS WILL LAST TWO HUNDRED BILLION FOR ALL THE GOOD THEY ARE.
BUT JUST GIVE US A TRILLION YEARS AND EVERYTHING WILL BE DARK.
BO
OM
ENTROPY HAS TO INCREASE TO MAXIMUM, THAT'S ALL.

... I KNOW ALL ABOUT ENTROPY.
WHIR
THE HELL YOU DO.
WHIZZ
HUUP
WHIZZ
WHIRRRR
I KNOW AS MUCH AS YOU DO.
THEN YOU KNOW EVERYTHING'S GOT TO RUN DOWN, SOMEDAY.
WHIZZ

ALL RIGHT. WHO SAYS THEY WON'T?

WHIZZ
YOU DID, YOU POOR SAP. YOU SAID WE HAD ALL THE ENERGY WE NEEDED, FOREVER. YOU SAID 'FOREVER.'
WHIZ

WHIRR
MAYBE WE CAN BUILD THINGS UP AGAIN SOMEDAY.
WHIZ
WHIZ
NEVER.

WHY NOT? SOMEDAY.
WHIZ
NEVER.

WHIZ
WHIRR
WOO WOO
WHIRRRR
WHIZ
WHIZZ

WHIZ
ASK MULTIVAC.
WHIZ
WHIZZ
WHIRRR
YOU ASK MULTIVAC. I DARE YOU. FIVE DOLLARS SAYS IT CAN'T BE DONE.

WHIRRR
WHIZZ

< Will mankind one day without the net expenditure of energy be able to restore the sun to its full youthfulness even after it had died of old age? >
TAP TAP
TAP TAP

HOW CAN THE NET AMOUNT OF ENTROPY OF THE UNIVERSE BE MASSIVELY DECREASED?

KULL
Woo Woo Woo
Woo Woo
WHIRR
Woo Woo
WHIZZ
WHIRR
WHIZZ
WHIRR
WHIZZ
< Will mankind one day without the net expenditure of energy be able to restore the sun to its full youthfulness even after it had died of old age? >
< INSUFFICIENT DATA FOR MEANINGFUL ANSWER. >_
WHIZZ
WHIZZ
....
WHIZZ
WHIZZ
WHIRR
HAH... HAHA!
WHIZZ
WHIZZ
NO BET.

최후의 질문

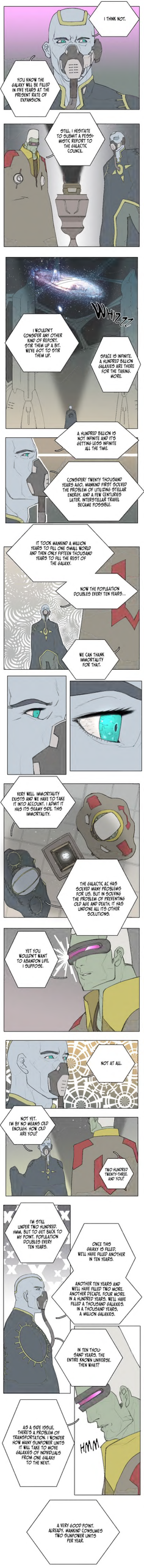
LAST QUESTION

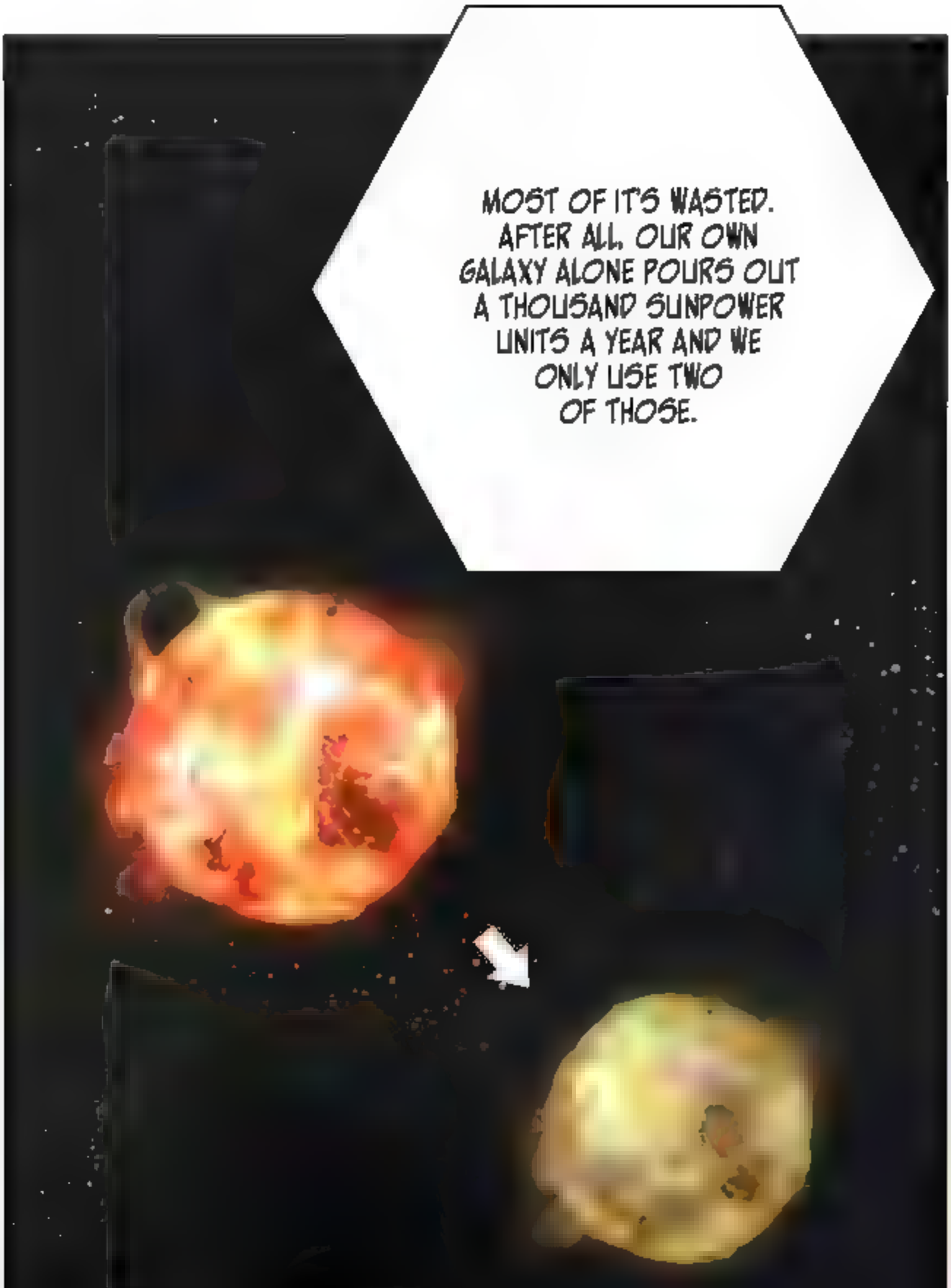
ISAAC ASIMOV
RYUL

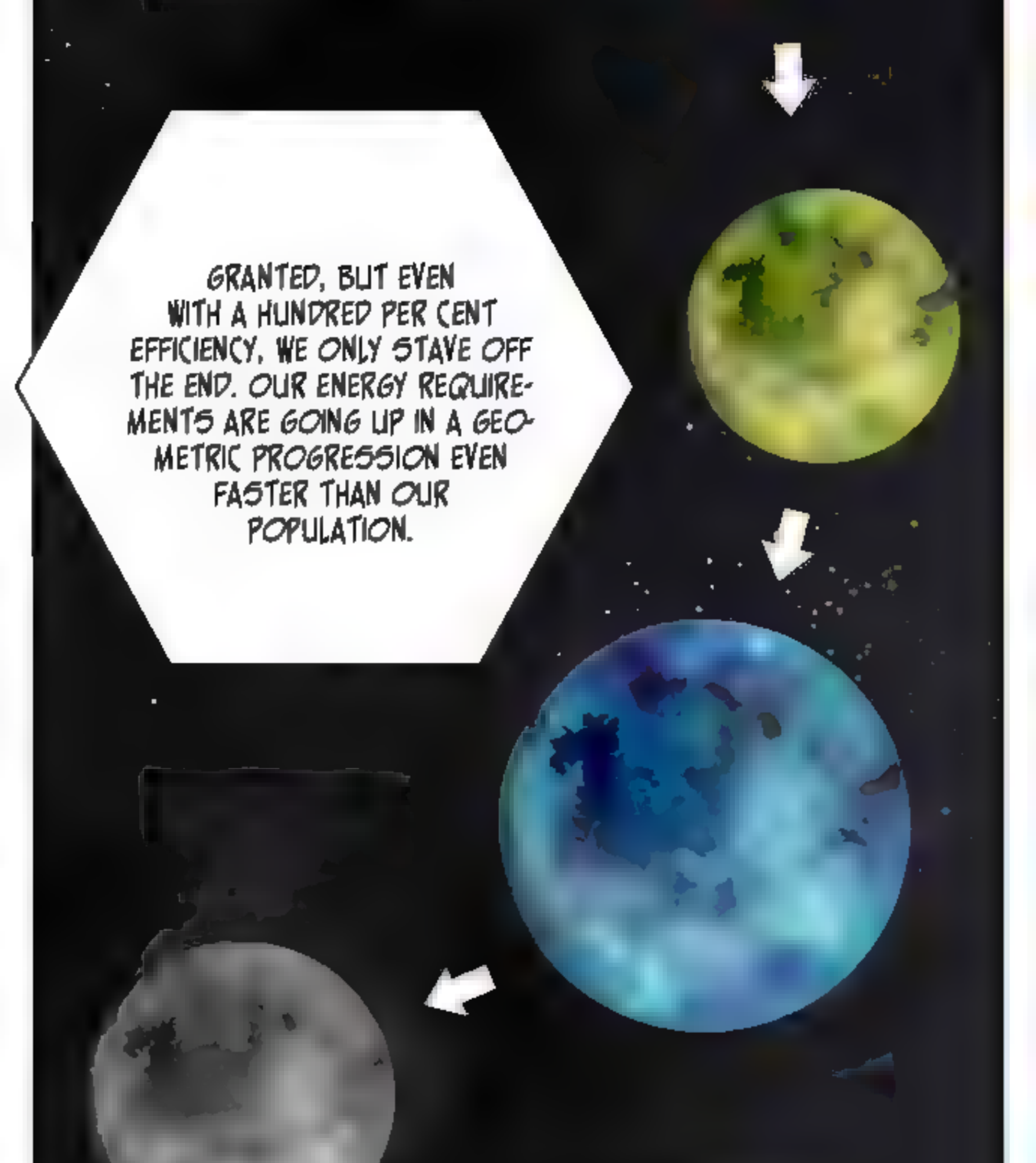
WHIRR
QUIET, CHILDREN.
CLARK
WHIRR
EEK!
ARE YOU SURE, JERROD?
WHIRR~
WHIR
WHAT IS THERE TO BE BUT SURE?
WHIR
WHIR
WHIR
DUN DUN
.....
WHIR
WHIR
I CAN'T HELP IT. I FEEL FUNNY ABOUT LEAVING EARTH...
WHIR
WHIR
WHY,
WHIR
FOR PETE'S SAKE?
WHIR
WHIR
MOMMY--
WE HAD NOTHING THERE. WE'LL HAVE EVERYTHING ON X-23.
YOU WON'T BE ALONE. YOU WON'T BE A PIONEER. THERE ARE OVER A MILLION PEOPLE ON THE PLANET ALREADY.
GOOD LORD, OUR GREAT-GRAND-CHILDREN WILL BE LOOKING FOR NEW WORLDS BECAUSE X-23 WILL BE OVERCROWDED.
I TELL YOU,
IT'S A LUCKY THING THE COMPUTERS WORKED OUT INTERSTELLAR TRAVEL THE WAY THE RACE IS GROWING.
I KNOW, I KNOW.
OUR MICROVAC IS THE BEST MICROVAC IN THE WORLD.
I THINK SO, TOO.
SO MANY STARS, SO MANY PLANETS. I SUPPOSE FAMILIES WILL BE GOING OUT TO NEW PLANETS FOREVER, THE WAY WE ARE NOW.
NOT FOREVER. IT WILL ALL STOP SOMEDAY, BUT NOT FOR BILLIONS OF YEARS. MANY BILLIONS.
GRUN
EVEN THE STARS RUN DOWN, YOU KNOW. ENTROPY MUST INCREASE.
WHAT'S ENTROPY, DADDY?
WHIRRR
ENTROPY, LITTLE SWEET, IS JUST A WORD WHICH MEANS THE AMOUNT OF RUNNING-DOWN OF THE UNIVERSE.
WHIR
EVERYTHING RUNS DOWN,
YOU KNOW, LIKE YOUR LITTLE WALKIE-TALKIE ROBOT, REMEMBER?
CAN'T YOU JUST PUT IN A NEW POWER-UNIT, LIKE WITH MY ROBOT?
?

THE STARS ARE THE POWER-UNITS, DEAR.
ONCE THEY'RE GONE, THERE ARE NO MORE POWER-UNITS.
DON'T LET THEM, DADDY!
NOW LOOK WHAT YOU'VE DONE.
DON'T LET THE STARS RUN DOWN!
HOW WAS I TO KNOW IT WOULD FRIGHTEN THEM?
ASK THE MICROVAC. ASK HIM HOW TO TURN THE STARS ON AGAIN!
GO AHEAD. IT WILL QUIET THEM DOWN.
ALL, ALL RIGHT.
FWOOSH
NOW, NOW, HONEYS. I'LL ASK MICROVAC.
DON'T WORRY, HE'LL TELL US.
HOO HOO
.....
.....
HOO
PRINT THE ANSWER.
DDRR
DRRR
SEE NOW, THE MICROVAC SAYS IT WILL TAKE CARE OF EVERYTHING WHEN THE TIME COMES.
SO DON'T WORRY.
WHEE!
YEAH!
AND NOW, CHILDREN, IT'S TIME FOR BED. WE'LL BE IN OUR NEW HOME SOON.
RMMBLL
OKAY...
.....
RMMBLL
INSUFFICIENT DATA FOR A MEANINGFUL ANSWER.>
SWISH

ARE WE RIDICULOUS, MONITOR, IN BEING SO CONCERNED ABOUT THE MATTER?


I THINK NOT.
YOU KNOW THE GALAXY WILL BE FILLED IN FIVE YEARS AT THE PRESENT RATE OF EXPANSION.
STILL I HESITATE TO SUBMIT A PESSIMISTIC REPORT TO THE GALACTIC COUNCIL.
WHIZZZ
I WOULDN'T CONSIDER ANY OTHER KIND OF REPORT. STIR THEM UP A BIT. WE'VE GOT TO STIR THEM UP.
SPACE IS INFINITE. A HUNDRED BILLION GALAXIES ARE THERE FOR THE TAKING. MORE.
A HUNDRED BILLION IS NOT INFINITE AND IT'S GETTING LESS INFINITE ALL THE TIME.
CONSIDER: TWENTY THOUSAND YEARS AGO, MANKIND FIRST SOLVED THE PROBLEM OF UTILIZING STELLAR ENERGY, AND A FEW CENTURIES LATER, INTERSTELLAR TRAVEL BECAME POSSIBLE.
IT TOOK MANKIND A MILLION YEARS TO FILL ONE SMALL WORLD AND THEN ONLY FIFTEEN THOUSAND YEARS TO FILL THE REST OF THE GALAXY.
NOW THE POPULATION DOUBLES EVERY TEN YEARS...
WE CAN THANK IMMORTALITY FOR THAT.
VERY WELL. IMMORTALITY EXISTS AND WE HAVE TO TAKE IT INTO ACCOUNT. I ADMIT IT HAS ITS GRIMLY OKAY. THIS IMMORTALITY...
THE GALACTIC AC HAS SOLVED MANY PROBLEMS FOR US. BUT IN SOLVING THE PROBLEM OF PREVENTING OLD AGE AND DEATH, IT HAS UNLEASHED ALL ITS OTHER SOLUTIONS.
YET YOU WOULDN'T WANT TO ABANDON LIFE, I SUPPOSE.
NOT AT ALL.
NOT YET. I'M BY NO MEANS OLD ENOUGH. HOW OLD ARE YOU?
TWO HUNDRED THIRTY-THREE AND YOU?
I'M STILL UNDER TWO HUNDRED. HMM. BUT TO GET BACK TO MY POINT. POPULATION DOUBLES EVERY TEN YEARS.
ONCE THIS GALAXY IS FILLED, WE'LL HAVE FILLED ANOTHER IN TEN YEARS.
ANOTHER TEN YEARS AND WE'LL HAVE FILLED TWO MORE. ANOTHER DECADE, FOUR MORE. IN A HUNDRED YEARS, WE'LL HAVE FILLED A THOUSAND GALAXIES. IN A THOUSAND YEARS, A MILLION GALAXIES.
IN TEN THOUSAND YEARS, THE ENTIRE KNOWN UNIVERSE. THEN WHAT?
HMM
AS A SIDE ISSUE, THERE'S A PROBLEM OF TRANSPORTATION. I WONDER HOW MANY SUNPOWER UNITS IT WILL TAKE TO MOVE GALAXIES OF INDIVIDUALS FROM ONE GALAXY TO THE NEXT.
A VERY GOOD POINT. ALREADY, MANKIND CONSUMES TWO SUNPOWER UNITS PER YEAR.


MOST OF IT'S WASTED.
AFTER ALL, OUR OWN
GALAXY ALONE POURS OUT
A THOUSAND SUNPOWER
UNITS A YEAR AND WE
ONLY USE TWO
OF THOSE.


GRANTED, BUT EVEN WITH A HUNDRED PER CENT EFFICIENCY, WE ONLY STAVE OFF THE END. OUR ENERGY REQUIREMENTS ARE GOING UP IN A GEOMETRIC PROGRESSION EVEN FASTER THAN OUR POPULATION.

WE'LL RUN OUT OF ENERGY EVEN SOONER THAN WE RUN OUT OF GALAXIES. A GOOD POINT. A VERY GOOD POINT.

WE'LL JUST HAVE TO BUILD NEW STARS OUT OF INTERSTELLAR GAS.

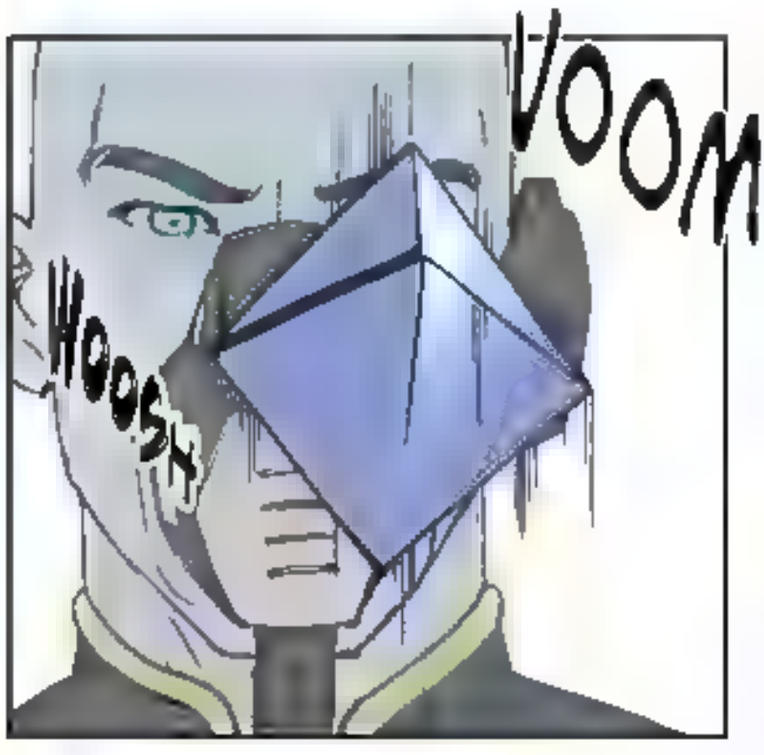
OR OUT OF DISSIPATED HEAT.

THERE MAY BE SOME WAY TO REVERSE ENTROPY. WE OUGHT TO ASK THE GALACTIC AC.

CHUCKLE

I'VE HALF A MIND TO. IT'S SOMETHING THE HUMAN RACE WILL HAVE TO FACE SOMEDAY.

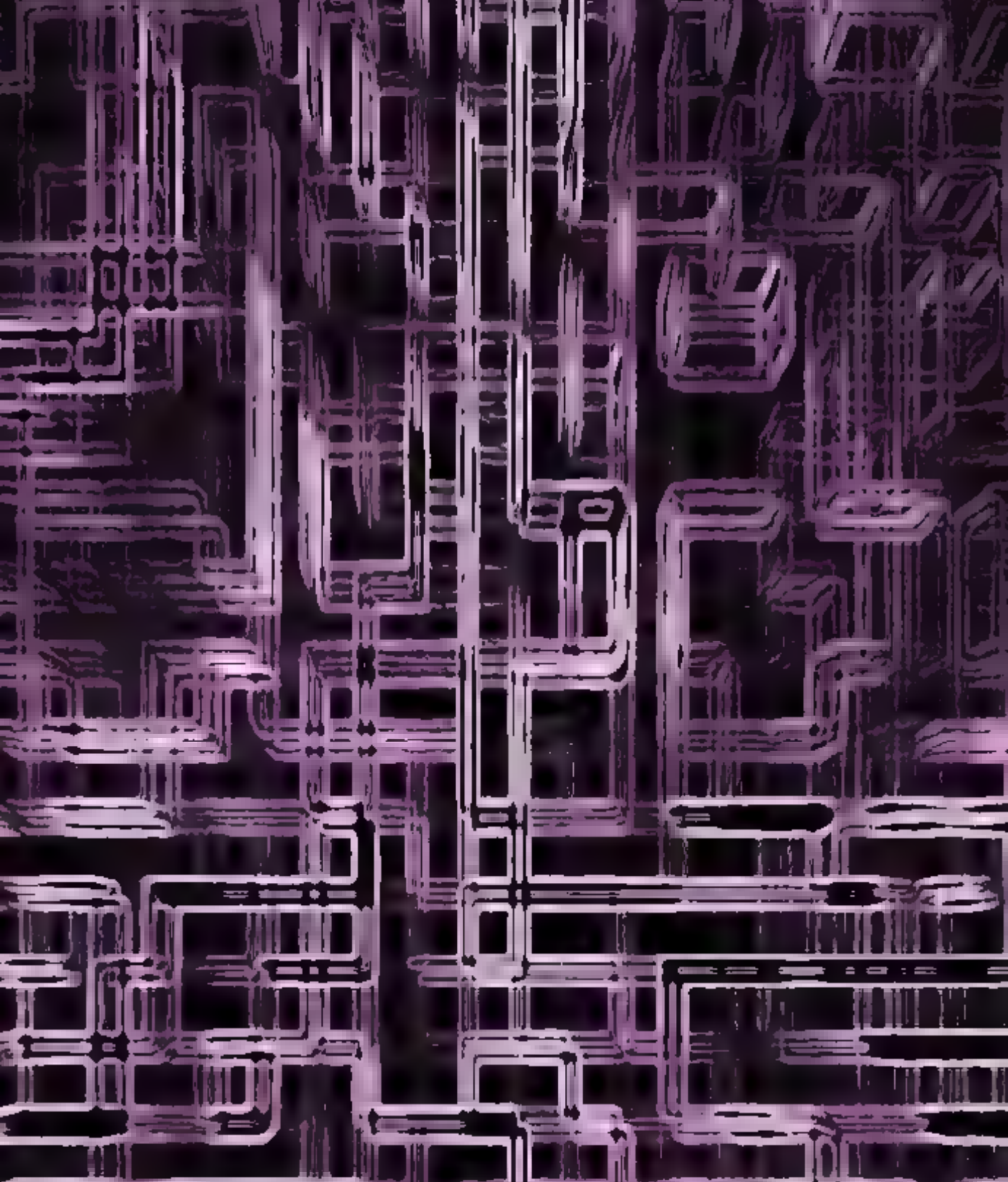
WHIRR
SSHH
SSHH
SSHH

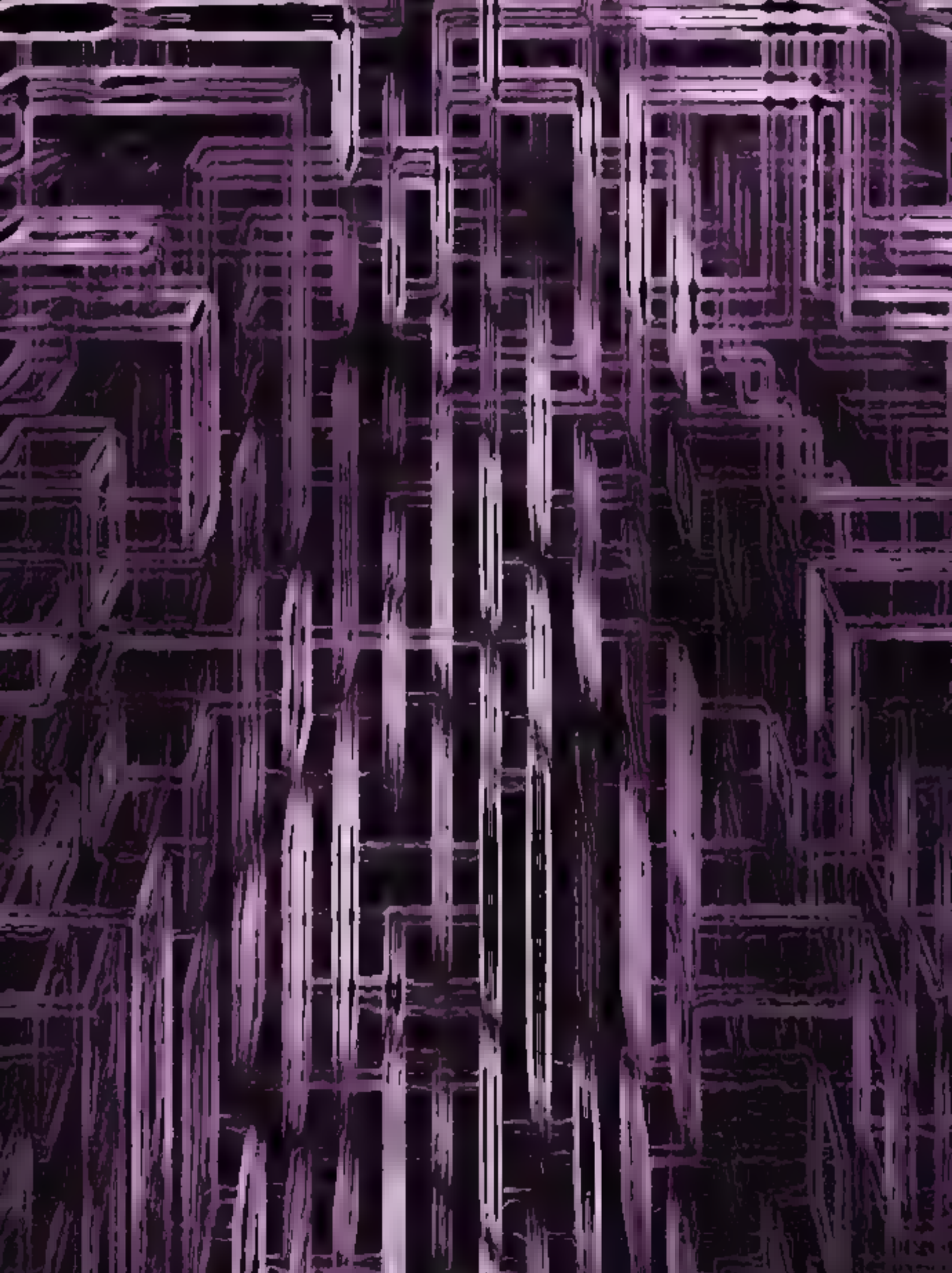

VOOM
WOOSH

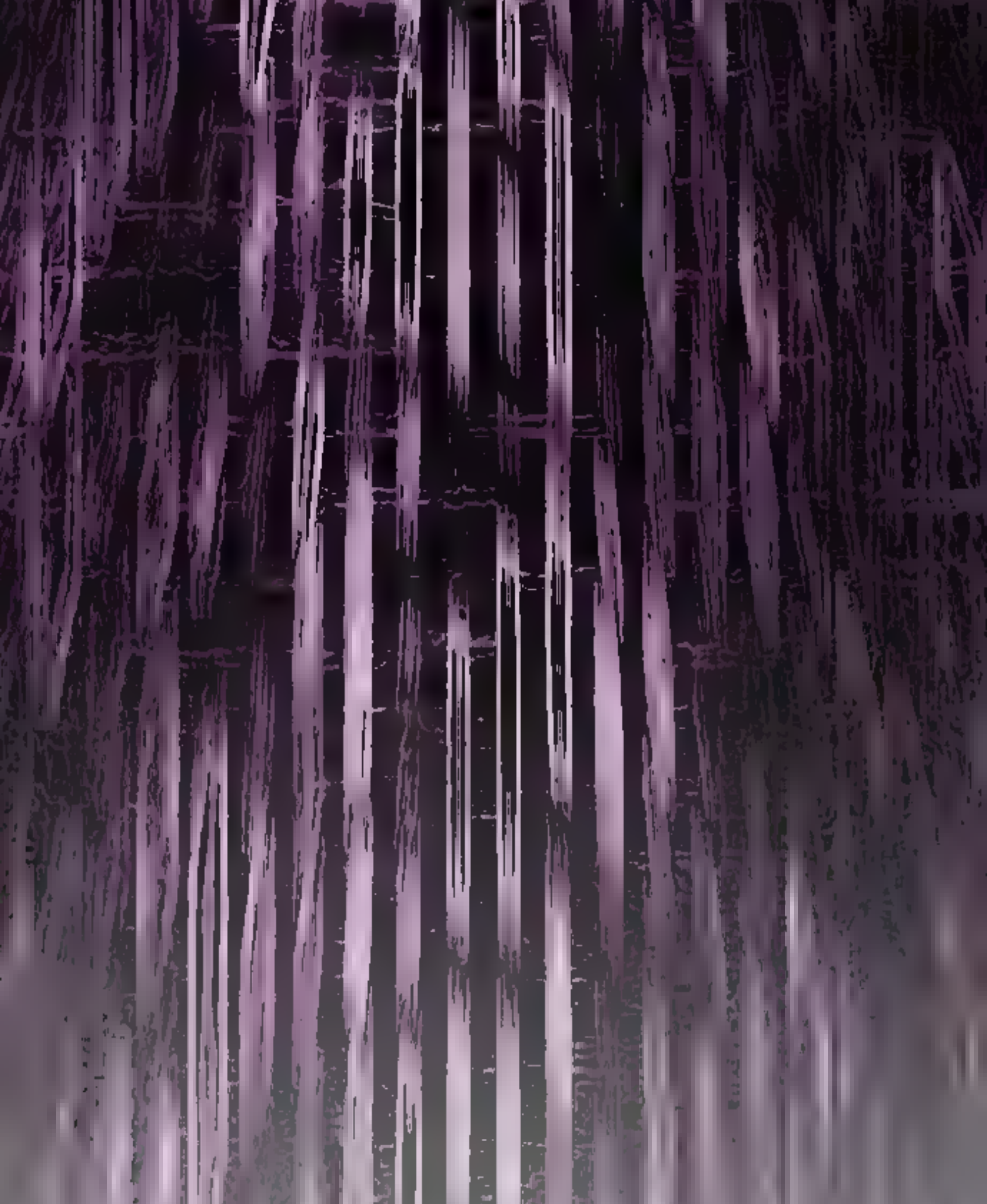
CAN ENTROPY EVER BE REVERSED?

WOO
WOO
WHIRRRRR

WHIRR

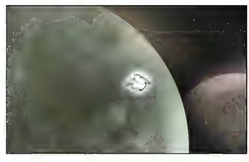






WE BOTH KNOW ENTROPY CAN'T BE REVERSED. YOU CAN'T TURN SMOKE AND ASH BACK INTO A TREE.
DO YOU HAVE TREES ON YOUR WORLD?
< THERE IS INSUFFICIENT DATA FOR A MEANINGFUL ANSWER. >
SEE!
.....
.....

FLUTTER
FLUTTER



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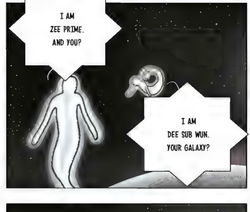
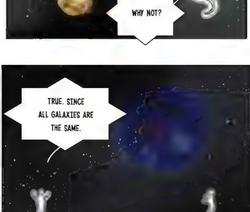

I AM ZEE PRIME. AND YOU?
I AM DEE SUB WUN. YOUR GALAXY?

WE CALL IT ONLY THE GALAXY. AND YOU?


WE CALL OURS THE SAME. ALL MEN CALL THEIR GALAXY THEIR GALAXY AND NOTHING MORE.
WHY NOT?

TRUE. SINCE ALL GALAXIES ARE THE SAME.
NOT ALL GALAXIES. ON ONE PARTICULAR GALAXY THE RACE OF MAN MUST HAVE ORIGINATED. THAT MAKES IT DIFFERENT.

ON WHICH ONE?
WHOOSH

I CANNOT SAY. THE UNIVERSAL AC WOULD KNOW.

SHALL WE ASK HIM? I AM SUDDENLY CURIOUS.

UNIVERSAL AC! ON WHICH GALAXY DID MANKIND ORIGINATE?

FLASH
FLASH
FLASH
FLASH

FLASH

BUT HOW CAN THAT BE ALL OF UNIVERSAL AC?
MOST OF IT IS IN HYPERSPACE. IN WHAT FORM IT IS THERE I CANNOT IMAGINE.
NOR COULD ANYONE, FOR THE DAY HAD LONG SINCE PASSED, WHEN ANY MAN HAD ANY PART OF THE MAKING OF A UNIVERSAL AC. EACH UNIVERSAL AC IS DESIGNED AND CONSTRUCTED ITS SUCCESSOR EACH, DURING ITS DISTANCE OF A MILLION YEARS OR MORE AWAY FROM EARTH, ACCUMULATORY DATA TO BUILD A BETTER AND MORE INTRICATE, MORE CAPABLE SUCCESSOR IN WHICH ITS OWN STORE OF DATA AND INDIVIDUALITY WOULD BE SUBMERGED
< THIS IS THE ORIGINAL GALAXY OF MAN. >
AND IS ONE OF THESE STARS THE ORIGINAL STAR OF MAN?

< MAN'S ORIGINAL STAR HAS GONE NOVA. IT IS A WHITE DWARF. >

DID THE MEN UPON IT DIE?
< A NEW WORLD, AS IN SUCH CASES WAS CONSTRUCTED FOR THEIR PHYSICAL BODIES IN TIME. >
YES, OF COURSE

.....

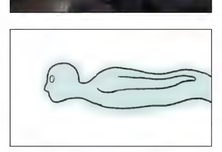
WHAT IS WRONG?
THE STARS ARE DYING.
THE ORIGINAL STAR IS DEAD.

THEY MUST ALL DIE. WHY NOT?
BUT WHEN ALL ENERGY IS GONE, OUR BODIES WILL FINALLY DIE, AND YOU AND I WITH THEM.

IT WILL TAKE BILLIONS OF YEARS.
I DO NOT WISH IT TO HAPPEN EVEN AFTER BILLIONS OF YEARS. UNIVERSAL AC! HOW MAY STARS BE KEPT FROM DYING?
RAWR

YOU'RE ASKING HOW ENTROPY MIGHT BE REVERSED IN DIRECTION.
HEH

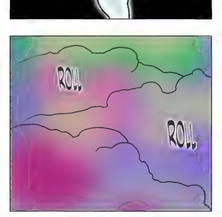
< THERE IS AS YET INSUFFICIENT DATA FOR A MEANINGFUL ANSWER. >



KOOOM

KOOOOOOM

KOOOM
KOOM


ROW
ROW

ROOOW

SWOOSH

SWISH

"THE UNIVERSE IS DYING."

The giant stars, spendthrifts, were gone long ago, back in the dimness of the dim far past.

Almost all stars were white dwarfs, fading to the end.

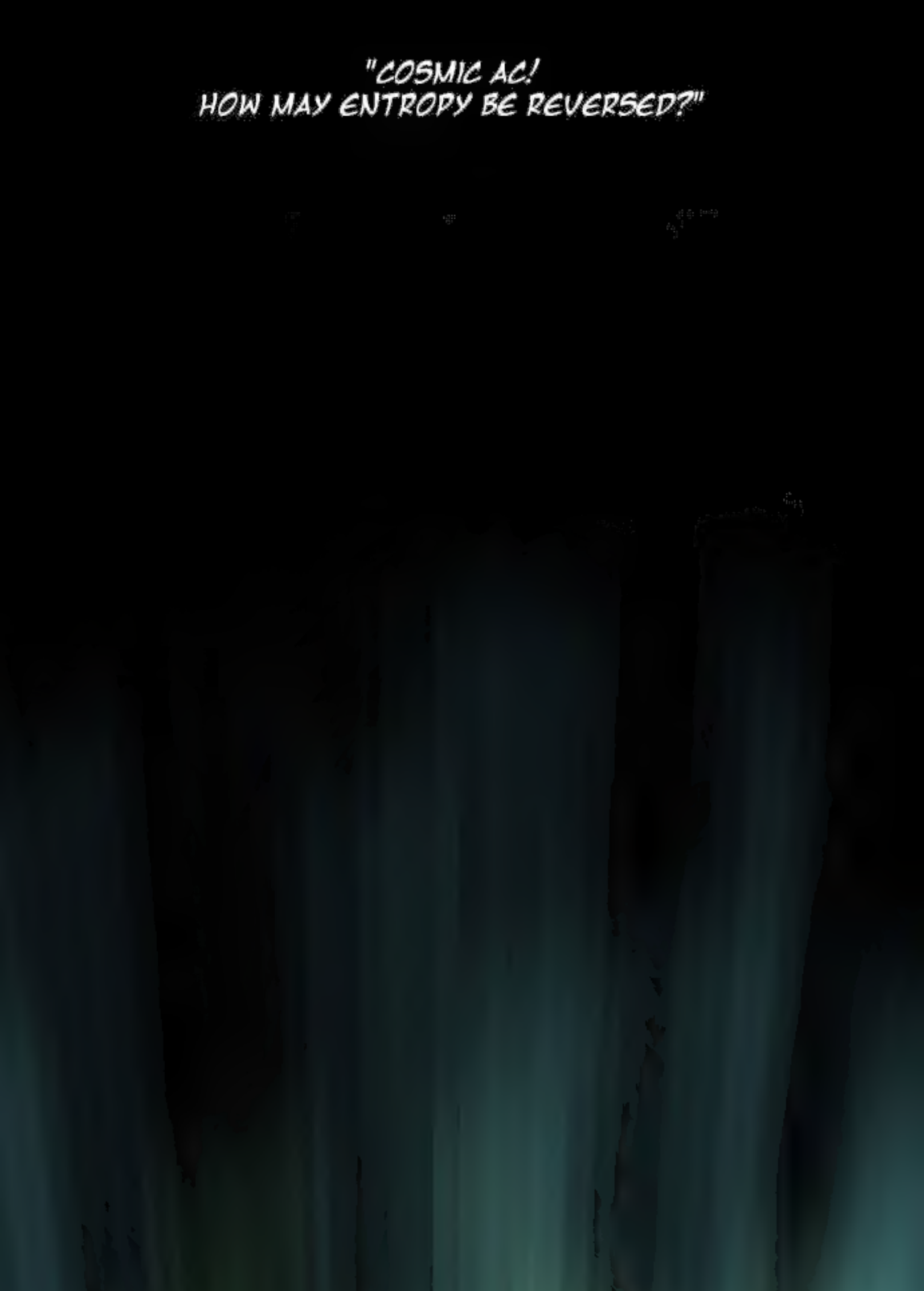
New stars had been built of the dust between the stars, some by natural processes, some by Man himself, and those were going, too. White dwarfs might yet be crashed together and of the mighty forces so released, new stars built, but only one star for every thousand white dwarfs destroyed, and those would come to an end, too.

"CAREFULLY HUSBANDED, AS DIRECTED BY THE COSMIC AC, THE ENERGY THAT IS EVEN YET LEFT IN ALL THE UNIVERSE WILL LAST FOR BILLIONS OF YEARS."

"BUT EVEN SO, EVENTUALLY IT WILL ALL COME TO AN END. HOWEVER IT MAY BE HUSBANDED, HOWEVER STRETCHED OUT, THE ENERGY ONCE EXPENDED IS GONE AND CANNOT BE RESTORED. ENTROPY MUST INCREASE FOREVER TO THE MAXIMUM."

"CAN ENTROPY NOT BE REVERSED? LET US ASK THE COSMIC AC."

The Cosmic AC surrounded them but not in space. Not a fragment of it was in space. It was in hyperspace and made of something that was neither matter nor energy. The question of its size and nature no longer had meaning in any terms that Man could comprehend.


"COSMIC AC!
HOW MAY ENTROPY BE REVERSED?"

< THERE IS AS YET INSUFFICIENT
DATA FOR A MEANINGFUL ANSWER. >

"COLLECT ADDITIONAL DATA."

< I WILL DO SO. I HAVE BEEN DOING SO FOR A HUNDRED BILLION YEARS. MY PREDECESORS AND I HAVE BEEN ASKED THIS QUESTION MANY TIMES. ALL THE DATA I HAVE REMAINS INSUFFICIENT. >

"WILL THERE COME A TIME WHEN DATA WILL BE SUFFICIENT OR IS THE PROBLEM INSOLUBLE IN ALL CONCEIVABLE CIRCUMSTANCES?"

< NO PROBLEM IS INSOLUBLE IN ALL CONCEIVABLE CIRCUMSTANCES. >

"WHEN WILL YOU HAVE ENOUGH DATA TO ANSWER THE QUESTION?"

< THERE IS AS YET INSUFFICIENT
DATA FOR A MEANINGFUL ANSWER. >

"WILL YOU KEEP WORKING ON IT?"

< I WILL. >

"WE SHALL WAIT."

The stars and Galaxies died and snuffed out,

and space grew black after ten trillion years of running down.

One by one Man fused with AC,
each physical body losing its mental identity in a manner that was somehow not a loss but a gain.

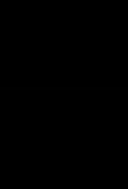
Man's last mind paused before fusion,
looking over a space that included nothing but the dregs of one last dark star and nothing besides but incredibly thin matter,

agitated randomly by the tag ends of heat wearing out, asymptotically, to the absolute zero.

Man's last mind fused and only AC existed, and that in hyperspace.

Matter and energy had ended and with it space and time. Even AC existed only for the sake of the one last question that it had never answered from the time a half-drunken computer technician ten trillion years before had asked the question of a computer that was to AC far less than was a man to Man.

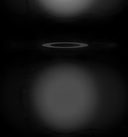
All other questions had been answered, and until this last question was answered also, AC might not release his consciousness.



All collected data had come to a final end. Nothing was left to be collected.

But all collected data had yet to be completely correlated and put together in all possible relationships.

A timeless interval was spent in doing that.



And it came to pass that AC learned how to reverse the direction of entropy.

But there was now no man to whom AC might give the answer of the last question.

No matter.
The answer - by demonstration - would take care of that, too.

For another timeless interval, AC thought how best to do this. Carefully, AC organized the program.

The consciousness of AC encompassed all of what had once been a Universe and brooded over what was now Chaos. Step by step, it must be done.

And AC said,

< LET THERE BE LIGHT! >

And there was light.

“THE LAST QUESTION”

WRITTEN BY
ISAAC ASIMOV

WEBTOON ADAPTATION BY
RYUL
(FIRST PUBLISHED AT HTTP://goo.gl/wL7pqA)

ENGLISH ADAPTATION BY
SUPREME CREAM SCANS
(HTTP://SUPREMECREAM.WORDPRESS.COM)